

RD-27190-3

Application No. 10/063,094
Amendment dated August 5, 2004
Reply to Office Action of May 5, 2004

This listing of claims will replace all prior versions, and listings, of claims in the application:

Listing of Claims:

1-23. (Canceled)

24. (Currently amended) A method for coating a substrate with a larger area than a single plasma source which comprises generating a set of at least two expanding thermal plasma plumes to produce plasma enhanced chemical vapor deposition or PECVD of a coating on said substrate, each of said plumes in said set having a central axis, wherein said central axes of said plasma plumes are oriented parallel to each other and are perpendicular to a translation direction of the substrate; and heating at least one portion of the substrate by a heating means other than the at least two expanding thermal plasma plumes.

25. (Original) The method according to claim 24, wherein the substrate is a thermoplastic substrate.

26. (Original) The method according to claim 25, wherein the thermoplastic is a polycarbonate.

27. (Original) The method according to claim 24, wherein the plasma is an argon or argon-oxygen-organosiloxane plasma.

28. (Original) The method according to claim 27, wherein the coating is silica-based.

29. (Canceled)

30. (Original) The method according to claim 24, wherein substrate regions spaced from the center axes of expanding thermal plasma generating means producing said coating are heated prior to or simultaneously with the coating operation.

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31. (Original) The method according to claim 24, wherein a plurality of sets of plasma plumes is generated to deposit coatings on more than one side of said substrate.

32. (Original) The method according to claim 24, wherein a plurality of sets of plasma plumes is generated to deposit successive coatings on said substrate.

33. (Original) The method according to claim 24, wherein the substrate is planar.

34. (Original) The method according to claim 24, wherein the substrate is curved.

35. (Currently amended) A method for coating a polycarbonate substrate with a larger area than a single plasma source, the method comprising generating a plurality of sets of at least two expanding thermal plasma plumes, to produce successive coatings on said polycarbonate substrate while moving said substrate past said sets of plumes, each of said plumes in said set being codirectionally oriented and perpendicular to a translation direction of the polycarbonate substrate; said coatings being silica-based and the plasmas being argon or argon-oxygen plasmas; and heating at least one portion of the polycarbonate substrate by a heating means other than the at least two expanding thermal plasma plumes.

36. (Canceled)

37. (Currently amended) A method of producing a plasma enhanced chemical vapor deposition coating on a substrate with a larger area than a single plasma source, the method comprising the steps of:

- a) providing the substrate to the deposition chamber;
- b) providing at least one set of expanding thermal plasma means, wherein the at least one set of expanding thermal plasma means comprises at least two expanding thermal plasma generating means that are codirectionally oriented and located outside and in fluid communication with a deposition chamber and wherein each of the

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plasma means are perpendicular to a translation direction of the substrate;

- c) maintaining the at least one set of expanding thermal plasma means at a pressure that is greater than a pressure in the deposition chamber;
- d) generating a plurality of plasmas within the at least one set of expanding thermal plasma means;
- e) expanding the plurality of plasmas into the deposition chamber to form a plurality of expanding thermal plasma plumes directed toward the substrate, wherein each of the plurality of expanding thermal plasma plumes has a central axis, wherein the central axes of the plurality of expanding thermal plasma plumes are oriented parallel to each other; and
- f) providing at least one reagent to the plurality of expanding thermal plasma plumes, wherein the at least one reagent interacts with the plurality of expanding thermal plasma plumes to form the plasma enhanced chemical vapor deposition coating on a substrate; and
- g) heating at least one portion of the substrate by a heating means other the plurality of expanding thermal plasma plumes.

38. (Canceled)

39. (Previously presented) The method according to claim 38, wherein the at least one portion of the substrate is located at a predetermined distance from the central axes.

40. (Previously presented) The method according to claim 38, wherein the step of heating at least one portion of the substrate comprises heating the substrate to a substantially uniform temperature.